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United States Department of Agriculture

Soil Conservation Service

Montana Basin Outlook Report March 1, 1994

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How forecasts are made

Most of the annual streamflow in the Western United States originates as snowfall that has accumulated high in the mountains during winter and early spring. As the snowpack accumulates, hydrologists estimate the runoff that will occur when it melts. Predictions are based on careful measurements of snow water equivalent at selected index points. Precipitation, temperature, soil moisture and antecedent streamflow data are combined with snowpack data to prepare runoff forecasts. Streamflow forecasts are coordinated by Soil Conservation Service and National Weather Service hydrologists. This report presents a comprehensive picture of water supply conditions for areas dependent upon surface runoff. It includes selected streamflow forecasts, summarized snowpack and precipitation data, reservoir storage data, and narratives describing current conditions.

Snowpack data are obtained by using a combination of manual and automated SNOTEL measurement methods. Manual readings of snow depth and water equivalent are taken at locations called snow courses on a monthly or semi-monthly schedule during the winter. In addition, snow water equivalent, precipitation and temperature are monitored on a daily basis and transmitted via meteor burst telemetry to central data collection facilities. Both monthly and daily data are used to project snowmelt runoff.

Forecast uncertainty originates from two sources: (1) uncertainty of future hydrologic and climatic conditions, and (2) error in the forecasting procedure. To express the uncertainty in the most probable forecast, four additional forecasts are provided. The actual streamflow can be expected to exceed the most probable forecast 50% of the time. Similarly, the actual streamflow volume can be expected to exceed the 90% forecast volume 90% of the time. The same is true for the 70%, 30%, and 10% forecasts. Generally, the 90% and 70% forecasts reflect drier than normal hydrologic and climatic conditions; the 30% and 10% forecasts reflect wetter than normal conditions. As the forecast season progresses, a greater portion of the future hydrologic and climatic uncertainty will become known and the additional forecasts will move closer to the most probable forecast.

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MONTANA Water Supply Outlook Report as of March 1, 1994

Most of February added little to Montana's snowpack. Storms the end of the month added much needed snow water to many areas. The Jefferson, Madison and Yellowstone major river basins faired the best with increases of 10 to 14 percent. The remaining basins increased 0 to 7 percent. The Kootenai, Clark Fork and Bitterroot river basins need above average March precipitation to insure adequate spring and summer surface water supplies.

SNOWPACK

February 1 snowpack conditions in the fourteen major river basins of Montana are 22 percent below average and the same as last year. With about 80 percent of the winter snowpack in place, there are several river basins across Montana that need a snowy March. By April 1, about 95 percent of the winter snowpack should be in place.

Snowpack extremes occurred in the Bears Paw Mountains, northcentral Montana, where the snowpack was 77 percent above average and 57 percent above last year and in the Rock Creek and East Side Bitterroot watersheds, northwest Montana, where the snowpack was 38 percent below average and 11 percent below last year.

West of the Continental Divide, snowpacks were 28 percent below average and 5 percent below last year. East of the Continental Divide snowpacks were 16 percent below average and 3 percent above last year.

RIVER BASIN	% OF AVERAGE	% OF LAST YEAR
KOOTENAI	72	99
FLATHEAD	78	100
UPPER CLARK FORK	68	92
BITTERROOT	68	92
LOWER CLARK FORK	66	85
JEFFERSON	70	83
MADISON	76	74
GALLATIN	82	112
MAINSTEM MISSOURI	107	118
HELENA VALLEY	74	91
MAINSTEM ABOVE FT. BENTON	82	101
MAINSTEM ABOVE FT. PECK RES	84	106
SMITH-JUDITH-MUSSELSHELL	94	108
SUN-TETON-MARIAS	83	118
ST. MARY	94	131
MILK (BEARS PAW MTNS.)	177	157
UPPER YELLOWSTONE	85	109
LOWER YELLOWSTONE	86	115
WIND	72	92
BIGHORN	92	126
TONGUE (NORTH BIGHORN MTNS)	97	131
POWDER (SOUTH BIGHORN MTNS)	90	131

BASIN SUMMARY OF

SNOW COURSE DATA

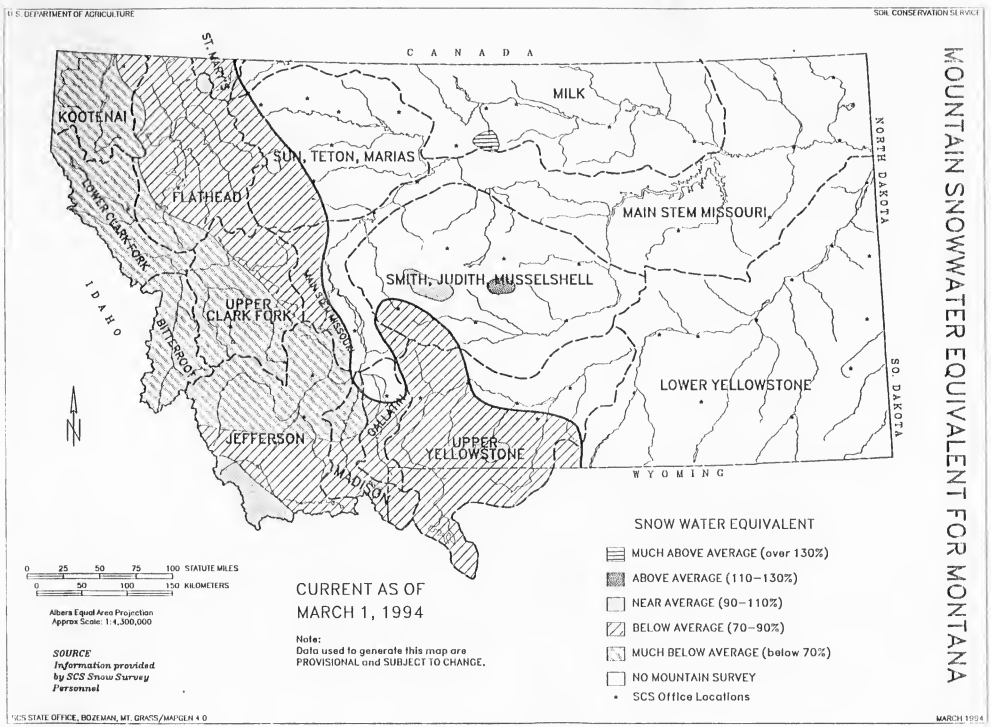
MARCH 1994

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
ABUNDANCE LAKE	8800	2/26/94	49	12.0	11.0	16.8
AMBROSE	6480	2/28/94	32	7.6	9.1	11.0
ASHLEY LAKE	4000	3/02/94	20	4.8	6.6	6.1
ARCH FALLS	7350	2/24/94	34	7.4	7.6	9.8
ASHLEY DIVIDE	4820	3/02/94	22	5.4	8.2	6.4
BADGER PASS PILLOW	6900	3/01/94	---	21.0	17.0	30.8
BANFIELD MTN PILLOW	5600	3/01/94	---	11.9	12.1	17.4
BAREE MIDWAY	4600	2/25/94	78	22.0	23.1	30.5
BAREE TRAIL	3800	2/25/94	30	7.6	8.8	8.6
BARKER LAKES PILLOW	8250	3/01/94	---	8.4	8.8	12.2
BASIN CREEK PILLOW	7180	3/01/94	---	5.5	5.4	4.9
BASSOO PEAK	5150	2/28/94	28	6.5	8.2	10.0
BEAGLE SPGS PILLOW	8850	3/01/94	---	7.5	6.2	6.8
BEAR BASIN	8150	2/23/94	46	13.2	15.2	17.6
BEAVER CREEK PILLOW	7850	3/01/94	---	11.1	14.7	14.8
BIG CREEK	6750	2/24/94	80	24.9	28.0	37.4
BIG SNOWY	7150	2/28/94	52	16.8	13.1	17.3
BISSON CREEK PILLOW	4920	3/01/94	---	6.5	7.6	9.7
BISSON CREEK	4920	2/25/94	30	7.6	10.0	8.1
BLACK BEAR PILLOW	7950	3/01/94	---	27.8	33.9	31.7
BLACK BEAR	7950	2/26/94	99	28.7E	36.0	35.2
BLACK MOUNTAIN	7750	2/23/94	34	8.0	8.6	12.2
BLACK PINE PILLOW	7100	3/01/94	---	8.5	7.8	10.5
BLACKTAIL	5650	3/02/94	35	10.2	12.0	12.6
BLOODY DICK PILLOW	7550	3/01/94	---	8.3	7.3	10.7
BLUE LAKE	5900	3/05/94	46	17.4	15.8	22.0
BOTS SOTS	7750	2/24/94	27	6.8	4.0	6.3
BOULDER MTN PILLOW	7950	3/01/94	---	13.5	13.4	17.0
BOX CANYON PILLOW	6700	3/01/94	---	7.6	8.7	8.8
BOX CANYON	6670	2/24/94	32	7.0	6.9	10.2
BOXELDER CREEK	5100	2/28/94	38	11.4	7.3	7.4
BRANHAM LAKES	8850	2/24/94	52	13.5	16.7	24.5
BRIDGER BOWL PILLOW	7250	2/26/94	---	15.8	13.6	20.6
BRIDGER BOWL	7250	2/26/94	63	20.1	14.6	21.5
BRUSH CREEK TIMBER	5000	3/01/94	21	4.6	6.5	8.6
BULL MOUNTAIN	6600	3/04/94	16	3.8	5.3	5.2
CABIN CREEK	5200	2/27/94	27	6.6	4.8	6.0
CALL ROAD	8050	2/29/94	35	7.2	10.2	9.4
CALVERT CR PILLOW	6430	3/01/94	---	4.9	6.9	8.0
CAMP SENIA	7890	2/24/94	20	4.1	2.8	4.6
CARROT BASIN PILLOW	9000	3/01/94	---	17.9	23.0	22.6
CARTER CREEK	7400	2/25/94	17	3.2	4.4	3.9
CHESSMAN RESERVOIR	6200	3/01/94	12	2.8	3.4	3.4
CHICKEN CREEK	4060	2/23/94	54	13.9	13.1	14.3
CLOVER MDW PILLOW	8800	3/01/94	---	11.1	12.9	14.9
COLE CREEK PILLOW	7850	3/01/94	---	13.3	7.9	12.9
COMBINATION PILLOW	5600	3/01/94	---	3.2	4.7	5.1
COPPER BOTTOM PILLOW	5200	3/01/94	---	9.3	9.6	10.0
COPPER BOTTOM	5200	2/24/94	46	10.6	8.0	10.4
COPPER CAMP PILLOW	6950	3/01/94	---	16.0	17.0	29.8
COPPER CAMP	6950	3/06/94	51	16.4	17.4	26.0
COPPER CREEK	5700	2/24/94	48	10.4	10.5	13.4

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
COPPER MOUNTAIN	7700	2/22/94	25	4.8	8.4	9.1
COTTONWOOD CREEK	6400	2/23/94	22	4.2	4.8	6.5
COYOTE HILL	4200	2/28/94	32	8.2	7.2	9.5
CREVICE MOUNTAIN	8400	2/25/94	36	8.2	9.6	9.0
CRYSTAL LAKE PILLOW	6050	3/01/94	---	13.1	9.4	10.7
CRYSTAL LAKE	6050	2/28/94	43	13.8	9.6	11.4
DAD CREEK LAKE	8400	2/28/94	44	9.8	9.8	11.0
DAISY PEAK	7600	3/01/94	31	7.5	7.6	9.0
DALY CREEK PILLOW	5780	3/01/94	---	7.1	6.6	10.0
DALY CREEK	5780	2/28/94	30	6.8	7.8	9.8
DARKHORSE LK. PILLOW	8700	3/01/94	---	20.2	16.9	27.9
DAVIS CREEK	5400	4/04/94	36	12.9	13.8	21.1
DEADMAN CR PILLOW	6450	3/01/94	---	9.6	8.0	8.6
DESERT MOUNTAIN	5600	2/28/94	41	11.1	11.1	13.2
DISCOVERY BASIN	7050	2/25/94	30	6.4	7.0	8.6
DIVIDE PILLOW	7800	3/01/94	---	7.1	10.2	8.9
DIVIDE	7800	2/28/94	32	6.6	10.4	9.1
DIX HILL	6400	2/27/94	30	7.6	8.1	10.7
DUPUYER CREEK PILLOW	5750	3/01/94	---	11.8	7.0	10.6
EAST FORK R.S.	5400	2/26/94	17	3.4	3.8	6.0
EL DORADO MINE	7800	3/01/94	43	13.0	11.8	16.7
ELK HORN SPRINGS	7800	2/26/94	24	4.2	5.8	7.8
ELK PEAK	8000	2/22/94	34	10.2	11.6	13.4
EMERY CREEK PILLOW	4350	3/01/94	---	12.9	10.5	14.0
FATTY CREEK	5500	2/24/94	58	15.9	18.8	20.2
FISHER CREEK PILLOW	9100	3/01/94	---	23.9	23.8	30.3
FIVE-BULL	5700	3/05/94	17	3.7	5.3	5.8
FLATTOP MTN PILLOW	6300	3/01/94	---	33.9	25.7	40.9
FLEECER RIDGE	7500	3/04/94	27	5.8	7.4	9.0
FOOLHEN	8280	2/27/94	36	7.9	9.8	13.8
FOUR MILE	6900	2/24/94	22	4.5	5.5	7.1
FREIGHT CREEK	6000	3/05/94	36	11.2	9.0	12.9
FROHNER MDWS PILLOW	6480	3/01/94	---	5.1	6.0	7.2
GARVER CREEK PILLOW	4250	4/04/94	---	9.0e	7.6	9.2
GARVER CREEK	4250	4/04/94	30	9.7	9.5	9.9
GIBBONS PASS	7100	3/01/94	---	12.6E	--	19.8
GOAT MOUNTAIN	7000	2/28/94	29	6.8	7.4	9.2
GRASSHOPPER	7000	2/22/94	18	4.4	5.4	4.9
GRAVE CRK PILLOW	4300	3/01/94	---	13.9	10.6	15.2
GRIFFIN CR DIVIDE	5150	2/28/94	30	7.4	8.7	10.0
HAND CREEK PILLOW	5030	3/01/94	---	7.4	9.1	10.9
HAWKINS LAKE PILLOW	6450	3/01/94	---	13.7	14.4	24.2
HEBGEN DAM	6550	2/23/94	35	8.4	13.1	10.8
HELL ROARING DIVIDE	5770	2/24/94	72	20.2	21.0	26.4
HERRIG JUNCTION	4850	2/28/94	68	20.4	18.7	21.7
HOLBROOK	4530	2/22/94	29	7.7	6.0	8.8
HOODOO BASIN PILLOW	6050	3/01/94	---	24.0	25.5	39.7
HOODOO BASIN	6050	3/01/94	---	26.3E	28.8	42.7
HOODOO CREEK	5900	3/01/94	---	21.6E	25.0	39.2
INDEPENDENCE	7850	2/24/94	44	11.6	11.9	15.6
INTERGAARD	6450	2/23/94	18	4.0	4.6	6.8
JOHNSON PARK	6450	3/01/94	22	5.3	5.5	6.4
KISHENEHN	3890	2/26/94	34	7.2	7.2	7.5
KIWANIS CAMP	3720	2/28/94	17	4.1	2.9	1.8
KRAFT CREEK PILLOW	4750	3/01/94	---	10.9	10.3	14.5
LAKE CREEK	6100	2/28/94	27	6.2	9.2	7.4
LAKEVIEW CANYON	6930	2/25/94	29	4.8	12.4	9.4
LAKEVIEW RDG. PILLOW	7400	3/01/94	---	5.9	13.3	10.3

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
LAKEVIEW RIDGE	7400	2/25/94	29	4.1	11.8	8.6
LEMHI RIDGE PILLOW	8100	3/01/94	---	8.4	6.2	8.9
LEMHI RIDGE	8100	2/27/94	42	9.2	6.9	8.7
LICK CREEK PILLOW	6860	3/01/94	---	7.2	7.1	10.7
LICK CREEK	6860	2/24/94	32	6.7	7.2	8.3
LITTLE PARK	7400	2/23/94	37	10.2	11.9	13.4
LOGAN CREEK	4300	3/01/94	22	5.0	6.8	6.7
LONE MOUNTAIN	8880	3/01/94	48	13.4	15.6	19.9
LOWER TWIN PILLOW	7900	3/01/94	---	8.5	11.4	15.0
LOWER TWIN	7900	2/24/94	36	9.9	13.1	18.0
LUBRECHT PILLOW	4680	3/01/94	---	4.0	5.0	5.8
LUBRECHT FLUME	4680	3/01/94	14	3.7	4.1	5.4
LUBRECHT FOREST NO 3	5450	3/01/94	15	3.4	4.7	6.3
LUBRECHT FOREST NO 4	4650	3/01/94	6	1.3	3.3	3.1
LUBRECHT FOREST NO 6	4040	3/01/94	5	1.1	3.4	3.7
LUBRECHT HYDROPLOT	4200	3/01/94	17	3.4	3.5	6.4
MADISON PLT PILLOW	7750	3/01/94	---	16.9	20.1	20.6
MANY GLACIER PILLOW	4900	3/01/94	---	15.7	10.8	14.8
MARIAS PASS	5250	2/24/94	57	15.3	13.0	14.9
MAYNARD CR PILLOW	6210	2/26/94	---	8.3	6.7	9.1
MAYNARD CREEK	6210	2/26/94	38	10.3	8.3	12.4
MIDDLE MILL CREEK	7850	2/24/94	36	8.4	8.8	13.5
MILL CREEK	7500	2/28/94	46	12.4	8.0	10.2
MINERAL CREEK	4000	2/27/94	62	18.9	12.1	15.9
MONUMENT PK PILLOW	8850	3/01/94	---	14.7	13.1	17.8
MONUMENT PEAK	8850	2/24/94	55	16.3	--	22.2
MOSS PEAK PILLOW	6780	3/01/94	---	23.0	25.2	31.4
MT LOCKHART PILLOW	6400	3/01/94	---	14.6	12.1	18.0
MOUNT LOCKHART	6400	3/01/94	55	16.6	15.0	19.7
MULE CREEK PILLOW	8300	3/01/94	---	9.1	9.6	13.2
MULE CREEK	8300	2/26/94	36	7.0	9.2	12.7
NEVADA CREEK PILLOW	6480	3/01/94	---	8.4	9.9	11.2
NEVADA CREEK	6480	3/06/94	33	8.9	10.7	11.6
NEW WORLD	6900	2/24/94	39	9.0	8.6	12.0
NEWTON MOUNTAIN	5600	3/01/94	70	21.0	22.4	29.0
NEZ PERCE CMP PILLOW	5650	3/01/94	---	10.2	9.8	13.0
NEZ PERCE CREEK	6600	2/22/94	17	3.0	5.0	5.9
NEZ PERCE PASS	6570	2/27/94	39	10.6	11.0	14.6
NOISY BASIN PILLOW	6040	3/01/94	---	26.7	29.4	33.7
N.F. ELK CR PILLOW	6250	3/01/94	---	7.3	8.1	10.8
N.F. ELK CREEK	6250	3/01/94	27	6.8	7.7	10.5
NF JOCKO PILLOW	6330	3/01/94	---	27.5	26.3	40.3
NORTH FORK JOCKO	6330	2/24/94	84	26.9	27.6	38.2
N.E. ENTRANCE PILLOW	7350	3/01/94	---	6.6	5.7	8.1
NORTHEAST ENTRANCE	7350	3/01/94	31	6.5	5.7	8.1
NOTCH	8500	2/28/94	45	11.0	13.8	12.4
OPHIR PARK	7150	2/27/94	39	9.6	10.2	14.7
PETERSON MDW PILLOW	7200	2/25/94	---	5.1	6.2	8.5
PETERSON MEADOWS	7200	2/25/94	26	4.8	6.2	8.4
PICKFOOT CRK PILLOW	6650	3/01/94	---	7.8	9.4	9.1
PICKFOOT CREEK	6650	2/23/94	28	6.6	7.2	9.2
PIKE CREEK PILLOW	5930	3/01/94	---	19.0	16.6	22.8
PIPESTONE PASS	7200	2/23/94	13	2.5	3.9	4.1
PLACER BASIN PILLOW	8830	3/01/94	---	15.1	12.8	15.3
PORCUPINE PILLOW	6500	3/01/94	---	4.1	5.5	6.1
POTOMAGETON PARK	7150	2/23/94	35	8.6	12.5	12.6
RED MOUNTAIN	6000	3/01/94	---	11.2E	--	16.0
RED TOP	5260	3/01/94	59	19.4	18.2	24.0

SNOW COURSE	ELEVATION	DATE	SNOW DEPTH	WATER CONTENT	LAST YEAR	AVERAGE 1961-90
REVAIS CREEK	4800	2/24/94	8	1.4	6.9	3.1
ROCK CREEK	5600	2/28/94	34	10.4	8.8	8.7
ROCK CREEK MEADOW	8160	2/28/94	56	14.4	15.8	17.4
ROCKER PEAK PILLOW	8000	3/01/94	---	8.5	8.7	12.6
ROCKER PEAK	8000	2/28/94	34	8.7	--	12.2
ROCKY BOY PILLOW	4700	2/28/94	---	7.1	5.2	4.6
ROCKY BOY	4700	2/28/94	24	6.1	3.3	4.0
SACAJAWEA	6550	2/28/94	34	9.6	9.6	11.8
SADDLE MTN PILLOW	7900	3/01/94	---	13.9	16.0	21.9
SHORT CREEK PILLOW	7000	3/01/94	---	4.3	5.1	4.9
SHOWER FALLS PILLOW	8100	3/01/94	---	15.6	15.2	18.8
SILVER RUN PILLOW	6630	3/01/94	---	4.1	3.0	5.2
SKALKAHO PILLOW	7260	3/01/94	---	11.5	12.6	20.8
SLIDE ROCK MOUNTAIN	7100	3/01/94	34	9.4	10.0	13.3
SMUGGLER MINE	6960	2/24/94	22	4.8	6.6	8.6
S.F. SHIELDS PILLOW	8100	3/01/94	---	9.8	11.0	14.2
SPOTTED BEAR MTN.	7000	3/05/94	27	8.6	10.4	13.3
SPUR PARK PILLOW	8100	3/01/94	---	18.1	15.6	18.6
SQUAW PEAK	6150	2/24/94	43	10.6	13.4	13.0
STAHL PEAK PILLOW	6030	3/01/94	---	23.0	20.2	30.2
STEMPLE PASS	6600	2/25/94	33	6.8	8.0	8.5
STORM LAKE	7780	2/25/94	34	6.6	8.5	10.8
STRYKER BASIN	6180	2/28/94	71	21.2	21.4	28.5
STUART MOUNTAIN	7400	2/24/94	62	18.1	21.0	27.4
SUCKER CREEK	3960	2/28/94	4	.7	.8	.4
TAYLOR ROAD	4080	2/28/94	29	7.3	4.6	3.1
TEN MILE LOWER	6600	2/24/94	27	4.8	4.8	6.3
TEN MILE MIDDLE	6800	3/01/94	30	7.0	6.7	9.5
TEPEE CREEK PILLOW	8000	3/01/94	---	8.6	13.3	10.9
TEPEE CREEK	8000	2/29/94	44	9.7	16.0	12.5
TIMBERLINE CREEK	8850	2/24/94	40	10.9	6.6	11.5
TIZER BASIN PILLOW	6840	3/01/94	---	6.2	6.2	9.6
TRAIL CREEK	7090	2/27/94	34	6.8	5.4	6.9
TRINKUS LAKE	6100	3/05/94	77	28.4	29.0	36.7
TRUMAN CREEK	4060	3/01/94	---	3.9E	5.5	5.0
TV MOUNTAIN	6800	2/24/94	40	9.9	13.0	15.6
TWELVEMILE PILLOW	5600	3/01/94	---	13.3	14.3	16.4
TWENTY-ONE MILE	7150	3/01/94	44	11.2	17.0	14.9
TWIN CREEKS	3580	3/05/94	26	8.2	7.8	10.7
UPPER HOLLAND LAKE	6200	3/05/94	66	23.4	22.2	30.4
WALDRON PILLOW	5600	3/01/94	---	10.8	7.8	10.0
WALDRON	5600	3/01/94	30	7.4	6.0	9.0
WARM SPRINGS PILLOW	7800	3/01/94	---	11.7	11.5	18.2
WEASEL DIVIDE	5450	4/04/94	65	23.0	19.8	29.5
WEST YELL'ST PILLOW	6700	3/01/94	---	5.4	8.1	7.9
WEST YELLOWSTONE	6700	3/01/94	30	7.7	13.4	10.3
WHISKEY CREEK PILLOW	6800	3/01/94	---	11.6	16.0	14.5
WHITE MILL PILLOW	8700	3/01/94	---	17.2	13.9	21.2
WHITE PINE RIDGE	8850	2/27/94	24	4.4	5.2	4.4
WILLOW CREEK	6500	2/23/94	23	5.0	3.5	7.1
WOOD CREEK PILLOW	5960	3/01/94	---	7.0	7.0	9.7
WRONG CREEK	5700	2/25/94	42	9.8	8.3	12.0
WRONG RIDGE	6800	2/26/94	44	12.1	11.1	16.6


U. S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
MOUNTAIN SNOWWATER EQUIVALENT FOR MONTANA
C A N A D A
ST MARYS
KOOTENAI
FLATHEAD
LOWER CLARK FORK
SUN, TETON, MARIAS
MILK
NORTH DAKOTA
MAIN STEM MISSOURI
SMITH, JUDITH, MUSSELSHELL
MAIN STEM MISSOURI
UPPER CLARK FORK
BITTERROOT
I D A H O
GALLATIN
LOWER YELLOWSTONE
SO. DAKOTA
JEFFERSON
MADISON
UPPER YELLOWSTONE
W Y O M I N G
N
0 25 50 75 100 STATUTE MILES
0 50 100 150 KILOMETERS
Albers Equal Area Projection
Approx Scale: 1:4,300,000
SOURCE
Information provided by SCS Snow Survey Personnel
CURRENT AS OF MARCH 1, 1994
Note:
Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE.
SNOW WATER EQUIVALENT
MUCH ABOVE AVERAGE (over 130%)
ABOVE AVERAGE (110–130%)
NEAR AVERAGE (90–110%)
BELOW AVERAGE (70–90%)
MUCH BELOW AVERAGE (below 70%)
NO MOUNTAIN SURVEY
SCS Office Locations
SCS STATE OFFICE, BOZEMAN, MT. GRASS/MAPGEN 4.0
MARCH 1994

PRECIPITATION

February mountain precipitation for the fourteen major river basins were 6 percent below average and 122 percent above last year.

West of the Continental Divide, mountain precipitation was 16 percent below average and 113 percent above last year and east of the Continental Divide was 1 percent below average and 93 percent above last year. Water year precipitation west of the Continental Divide was 29 percent below average and 6 percent below last year and east of the Continental Divide was 16 percent below average and 2 percent below last year.

RIVER BASIN	FEBRUARY % OF AVERAGE	WATER YEAR % OF AVERAGE
KOOTENAI	86	69
FLATHEAD	89	77
UPPER CLARK FORK	79	69
BITTERROOT	85	70
LOWER CLARK FORK	80	69
JEFFERSON	109	75
MADISON	129	79
GALLATIN	77	75
MAINSTEM MISSOURI	74	76
SMITH-JUDITH-MUSSELSHELL	81	95
SUN-TETON-MARIAS	89	79
ST. MARY AND MILK	117	86
UPPER YELLOWSTONE	104	84
LOWER YELLOWSTONE	112	110
WIND RIVER	121	84
BIGHORN	114	110
POWDER & TONGUE	111	110

RESERVOIRS

Reservoir storages statewide were 1 percent above average and 18 percent above last year. West of the Continental Divide, reservoirs were 20 percent below average and 23 percent above last year. East of the Continental Divide, reservoirs were 5 percent above average and 13 percent above last year.

RIVER BASIN	% OF CAPACITY	% OF AVERAGE
KOOTENAI	41	123
FLATHEAD	30	51
UPPER CLARK FORK	79	118
BITTERROOT	13	35
LOWER CLARK FORK	98	110
JEFFERSON	65	117
MADISON	70	104
GALLATIN	38	103
MAINSTEM MISSOURI	75	98
SMITH-JUDITH-MUSSELSHELL	78	130
SUN-TETON-MARIAS	58	125
ST. MARY AND MILK	58	130
UPPER YELLOWSTONE	44	100
LOWER YELLOWSTONE	55	94

STREAMFLOW

Streamflow forecasts across Montana are 26 percent below average and the same percent as last years forecasts. West of the Continental Divide, streamflows are forecast to be 32 percent below average and 7 percent below last years forecasts. East of the Continental Divide, streamflows are forecast to be 22 percent below average and 4 percent above last years forecasts.

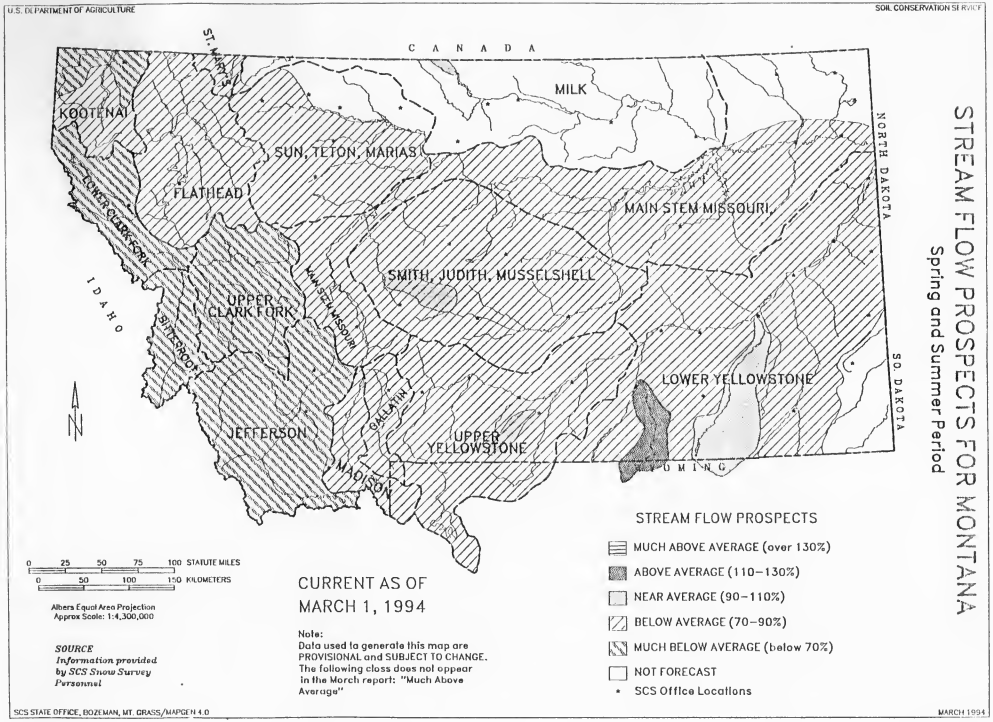
RIVER BASIN	FORECASTS % OF AVERAGE	FORECASTS % OF LAST YEAR
KOOTENAI	76	107
FLATHEAD	82	107
UPPER CLARK FORK	60	80
BITTERROOT	82	57
LOWER CLARK FORK	66	91
JEFFERSON	58	79
MADISON	78	87
GALLATIN	74	86
MAINSTEM MISSOURI	72	163
SMITH-JUDITH-MUSSELSHELL	79	123
SUN-TETON-MARIAS	83	95
ST. MARY AND MILK	88	112
UPPER YELLOWSTONE	83	107
LOWER YELLOWSTONE	85	116

NOTE: The FORECAST AS % OF LAST YEAR column above, is this years forecast as a percent of last years forecast, not of what actually occurred.

SURFACE WATER SUPPLY INDEX

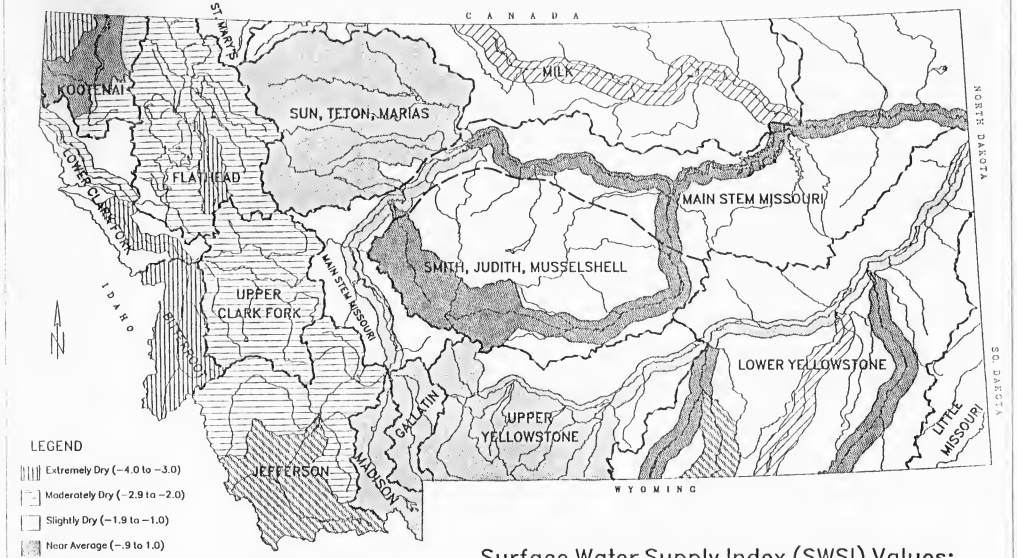
The Surface Water Supply Index (SWSI) is a measure of available surface water availability for the spring and summer months. Water users that rely on mountain precipitation can use the index to evaluate seasonal surface water supplies. The SWSI accounts for mountain snowpack, mountain precipitation, streamflow, reservoir storage, and soil moisture.

SWSI RATING	SURFACE WATER CONDITION
+3.0 to +4.0	Extremely Wet
+2.0 to +3.0	Moderately Wet
+1.0 to +2.0	Slightly Wet
-1.0 to +1.0	Near Average
-1.0 to -2.0	Slightly Dry
-2.0 to -3.0	Moderately Dry
-3.0 to -4.0	Extremely Dry


U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
STREAM FLOW PROSPECTS FOR MONTANA
Spring and Summer Period
C A N A D A
ST. MARY
MILK
KOOTENAI
SUN, TETON, MARIAS
FLATHEAD
NORTH DAKOTA
MAIN STEM MISSOURI
LOWER CLARK FORK
SMITH, JUDITH, MUSSELSHELL
I D A H O
UPPER CLARK FORK
MADISON-MISSOURI
BITTERROOT
LOWER YELLOWSTONE
SO. DAKOTA
GALLATIN
JEFFERSON
UPPER YELLOWSTONE
MADISON
W Y O M I N G
N
0 25 50 75 100 STATUTE MILES
0 50 100 150 KILOMETERS
Albers Equal Area Projection
Approx Scale: 1:4,300,000
SOURCE
Information provided by SCS Snow Survey Personnel
CURRENT AS OF MARCH 1, 1994
Note:
Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE. The following class does not appear in the March report: "Much Above Average"
STREAM FLOW PROSPECTS
MUCH ABOVE AVERAGE (over 130%)
ABOVE AVERAGE (110–130%)
NEAR AVERAGE (90–110%)
BELOW AVERAGE (70–90%)
MUCH BELOW AVERAGE (below 70%)
NOT FORECAST
SCS Office Locations
SCS STATE OFFICE, BOZEMAN, MT. GRASS/MAPGEN 4.0
MARCH 1994

SWSI's on March 1, were ranging from 2.8 to -3.2 statewide. West of the Continental Divide, SWSI's were ranging from -0.2 to -3.2 and east of the Continental Divide from 2.8 to -2.8.

SWSI	Basin
-1.0	Kootenai River at Ft. Steele (Kootenai in Canada)
-2.5	Tobacco River
-2.6	Kootenai Ft. Steele to Libby Dam
-0.2	Kootenai River below Libby Dam
-2.8	Fisher River
-3.0	Yaak River
-2.3	North Fork Flathead River
-2.2	Middle FORK Flathead River
-2.8	South Fork Flathead River
-2.4	Flathead River at Columbia Falls
-2.6	Stillwater/Whitefish Rivers
-3.0	Swan River
-2.5	Flathead River at Polson
-2.6	Mission Valley
-2.3	Little Bitterroot River
-2.8	Clark Fork River above Rock Creek
-2.4	Blackfoot River
-2.6	Clark Fork River above Missoula
-3.2	Bitterroot River
-3.0	Clark Fork River below Bitterroot River
-2.6	Clark Fork River below Flathead River
2.8	Beaverhead River
-2.1	Ruby River
-2.5	Big Hole River
-2.8	Boulder River (Jefferson)
-2.1	Jefferson River
-1.5	Madison River
-1.9	Gallatin River
-1.7	Missouri River above Canyon Ferry
-1.7	Missouri River below Canyon Ferry
-0.4	Smith River
-1.4	Sun River
-1.0	Teton River
0.7	Birch/Dupuyer Creeks
-1.2	Marias River
0.6	Musselshell River
-0.8	Missouri River above Ft. Peck
-0.4	Missouri River below Ft. Peck
1.9	Milk River (USBR users)
-1.9	Yellowstone River above Livingston
-1.8	Shields River
-1.8	Boulder River (Yellowstone)
-1.2	Stillwater River
-1.5	Rock/Red Lodge Creeks
-1.6	Clarks Fork River
-1.8	Yellowstone River above Bighorn River
-0.8	Bighorn River below Bighorn Lake
2.2	Little Bighorn River
-1.4	Yellowstone River below Bighorn River
1.2	Tongue River
0.3	Powder River



Surface Water Supply Index (SWSI) Values: March 1, 1994

Note: SWSI values are primarily an indicator of water supply conditions for irrigated lands within each basin. Data used to generate this map are PROVISIONAL and SUBJECT TO CHANGE. There are no basins designated as "Extremely Wet" in the March 1 report.

KOOTENAI RIVER BASIN in Montana as of March 1, 1994

Snowpack conditions in the Kootenai River Basin in Montana are below average and in the Kootenai River Basin in British Columbia, Canada, were near average. Snow water content in Montana was 28 percent below average and 1 percent below last year and in British Columbia, Canada, 9 percent below average and 50 percent above last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
EAST KOOTENAI in B.C.	26	150	91
KOOTENAI MAINTSTEM in MT	14	99	72
TOBACCO	3	118	80
FISHER	4	88	71
YAAK	6	98	71
KOOTENAI in MT	14	99	72
KOOTENAI ab Bonners Ferry	40	124	82

Mountain precipitation during February was 14 percent below average and 181 percent above last year. Water year precipitation, beginning October 1, 1993, was 31 percent below average and 2 percent above last year.

Lake Koocanusa storage, on the last day of February, was 23 percent above average and 39 percent above last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
LAKE KOOCANUSA	5748.0	2365.0	1696.0	1921.0

Streamflows, for the period April through July, are forecast to be 24 percent below average and 7 percent above last years forecasts.

Forecast Pt Forecast Period	<=== Drier === 90% (1000AF)	70% (1000AF)	Future Conditions Chance of Exceeding * 50% (Most Prob) (1000AF)	(% AVG.)	=== Wetter ===> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
TOBACCO nr Eureka							
APR-JUL	66	81	90	68	100	114	133
APR-SEP	73	89	100	68	111	128	147
KOOTENAI bl Libby Dam (1,2)							
APR-JUL	3410	4230	4600	80	4970	5790	5779
APR-SEP	3990	4950	5390	80	5830	6790	6772
FISHER nr Libby							
APR-JUL	126	149	164	70	179	200	234
APR-SEP	138	161	177	71	193	215	250

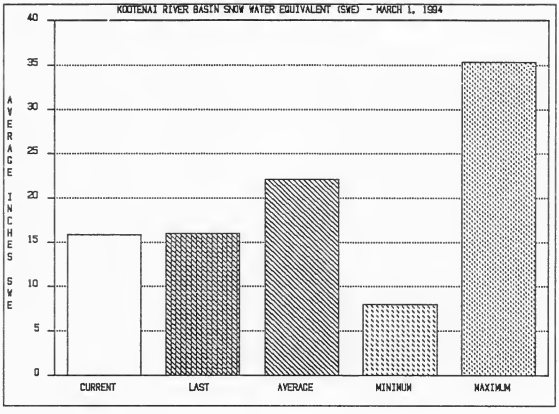
Forecast Pt / Forecast Period	90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
	<--- Drier ---		Future Conditions		--- Wetter --->		
	Chance of Exceeding *						
YAAK near Troy							
APR-JUL	235	280	310	64	340	385	483
APR-SEP	250	295	325	64	350	400	505
KOOTENAI at Leonia (1,2)							
APR-JUL	3880	4910	5380	75	5850	6880	7199
APR-SEP	4460	5640	6180	75	6720	7900	8275

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was -1.0 in the Kootenai at Ft. Steele (Kootenai in Canada); -2.5 in the Tobacco River; -2.6 in the Kootenai Ft. Steele to Libby Dam; -0.2 in the Kootenai River below Libby Dam; -2.8 in the Fisher River; and -3.0 in the Yaak River.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1972.

FLATHEAD RIVER BASIN as of March 1, 1994

Snowpack conditions in the Flathead River Basin were below average. Snow water content was 22 percent below average and the same as last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
NORTH FORK FLATHEAD	11	111	81
MIDDLE FORK FLATHEAD	8	123	86
SOUTH FORK FLATHEAD	8	100	79
STILLWATER-WHITEFISH	8	95	79
SWAN	9	95	74
MISSION VALLEY	5	92	70
LITTLE BITTERROOT-ASHLEY	9	77	72
JOCKO	5	85	68
FLATHEAD	43	100	78

Mountain precipitation during February was 11 percent below average and 168 percent above last year. Water year precipitation, beginning October 1, 1993, was 23 percent below average and 2 percent above last year.

Reservoir storage, on the last day of February, was 49 percent below average and 1 percent above last year. Combined Camas reservoir storage was 8 percent below average and 12 percent above last year; combined Mission Valley reservoir storage was 1 percent above average and 45 percent above last year; Hungry Horse storage was 64 percent below average and 6 percent below last year; and Flathead Lake storage was 16 percent below average and 8 percent above last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
CAMAS (4)	45.2	19.4	17.3	21.0
MISSION VALLEY (8)	100.0	38.2	26.3	37.8
HUNGRY HORSE	3451.0	793.2	844.0	2205.0
FLATHEAD LAKE	1791.0	743.2	684.8	881.0

Streamflows, for the period April through July, are forecast to be 18 percent below average and 7 percent above last years forecasts.

Streamflow Forecasts

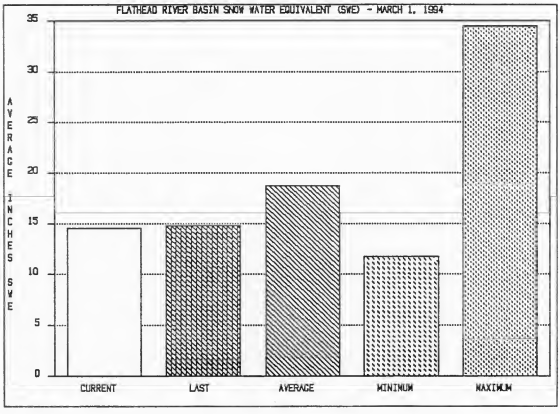
Forecast Pt / Forecast Period	<== Drier == 90% (1000AF)	70% (1000AF)	Future Conditions 50% (Most Prob) (1000AF)	(% AVG.)	== Wetter ==> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
	Chance of Exceeding *						
NF FLATHEAD nr Columbia Falls							
APR-JUL	1180	1290	1360	82	1430	1540	1662
APR-SEP	1310	1420	1500	82	1580	1690	1836
MF FLATHEAD nr West Glacier							
APR-JUL	1130	1270	1360	83	1450	1590	1638
APR-SEP	1240	1390	1490	83	1590	1740	1788
SF FLATHEAD nr Columbia Fls (1,2)							
APR-JUL	1340	1570	1670	81	1770	2000	2051
APR-SEP	1420	1670	1780	82	1890	2140	2184
FLATHEAD at Columbia Falls (2)							
APR-JUL	3890	4260	4510	82	4760	5130	5482
APR-SEP	4220	4620	4900	82	5180	5580	5960
STILLWATER nr Whitefish							
APR-JUL	127	141	150	79	160	174	189
APR-SEP	142	157	167	80	177	192	209
WHITEFISH nr Kalispell							
APR-JUL	65	74	81	78	88	98	104
APR-SEP	74	84	91	78	98	108	116
SWAN nr Bigfork							
APR-JUL	370	420	450	77	480	530	583
APR-SEP	425	480	515	77	550	605	665
FLATHEAD nr Polson (1,2)							
APR-JUL	4180	4950	5300	83	5650	6420	6390
APR-SEP	4530	5360	5740	83	6120	6950	6926

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was -2.3 in the North Fork Flathead River; -2.2 in the Middle Fork Flathead River; -2.8 in the South Fork Flathead River; -2.4 in the Flathead River at Columbia Falls; -2.6 in the Stillwater/Whitefish Rivers; -3.0 in the Swan River; -2.5 in the Flathead River at Polson; -2.6 in the Mission Valley; and -2.3 in the Little Bitterroot River.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1972.

UPPER CLARK FORK RIVER BASIN as of March 1, 1994

Snowpack conditions in the Upper Clark Fork River Basin were well below average. Snow water content was 32 percent below average and 8 percent below last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
CLARK FORK ab FLINT CREEK	15	94	71
FLINT CREEK	7	88	68
ROCK CREEK	5	86	62
CLARK FORK ab BLACKFOOT	24	92	69
BLACKFOOT	16	91	67
UPPER CLARK FORK	37	92	68

Mountain precipitation during February was 21 percent below average 33 percent above last year. Water year precipitation, beginning October 1, 1993, was 31 percent below average and 14 percent below last year.

Reservoir storage, on the last day of February, was 18 percent above average and 56 percent above last year. Georgetown Lake storage was 7 percent above average and 20 percent above last year; Lower Willow Creek storage was 141 percent above average and 215 percent above last year; and Nevada Creek storage was 34 percent above average and 1575 percent above last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
GEORGETOWN LAKE	31.0	27.5	22.9	25.7
LOWER WILLOW CREEK	4.9	4.1	1.3	1.7
NEVADA CREEK	12.6	6.7	0.4	5.0

Streamflows, for the period April through July, are forecast to be 40 percent below average and 20 percent below last years forecasts.

Streamflow Forecasts

Forecast Pt Forecast Period	<=== Drier === 90% (1000AF)	70% (1000AF)	Future Conditions Chance of Exceeding * 50% (Most Prob) (1000AF)	(% AVG.)	=== Wetter ===> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
MOULTON RES inflow (million gal.)							
APR-JUN	23	74	108	51	142	193	212
APR-JUL	18.0	75	113	48	151	210	234
WARM SPRINGS CK at Anaconda (2)							
APR-JUL	14.0	21	25	66	30	36	38
APR-SEP	20	27	32	68	37	44	47
LITTLE BLACKFOOT nr Garrison							
APR-JUL	11.0	40	60	72	80	109	83
APR-SEP	13.0	44	65	73	86	117	89
FLINT CK nr Southern Cross (2)							
APR-JUL	4.5	7.7	9.8	69	11.9	15.1	14.2
APR-SEP	5.1	9.1	11.8	71	14.5	18.5	16.7
FLINT CK bl Boulder Ck							
APR-JUL	18.0	31	39	68	47	60	57
APR-SEP	28	42	52	71	62	77	73
LOWER WILLOW CK RES inflow							
APR-JUL	2.7	6.1	8.5	61	10.9	14.3	14.0
APR-SEP	3.2	6.8	9.2	62	11.6	15.2	14.8
MF ROCK CK nr Philipsburg							
APR-JUL	25	33	39	59	45	53	66
APR-SEP	28	38	44	59	50	60	74
ROCK CK nr Clinton							
APR-JUL	90	131	159	54	187	230	296
APR-SEP	110	155	186	56	215	260	333
NEVADA CK nr Finn							
APR-JUL	3.6	9.1	12.8	67	16.5	22	19.1
APR-SEP	4.0	10.0	14.0	66	18.0	24	21
CLEARWATER nr Clearwater							
APR-JUL	91	104	113	66	122	135	172
APR-SEP	96	110	119	66	128	142	181
BLACKFOOT nr Bonner							
APR-JUL	365	465	530	63	595	695	835
APR-SEP	420	525	600	65	675	780	926
CLARK FORK ab Milltown							
APR-JUL	116	260	355	54	450	595	652
APR-SEP	156	315	420	56	525	685	755

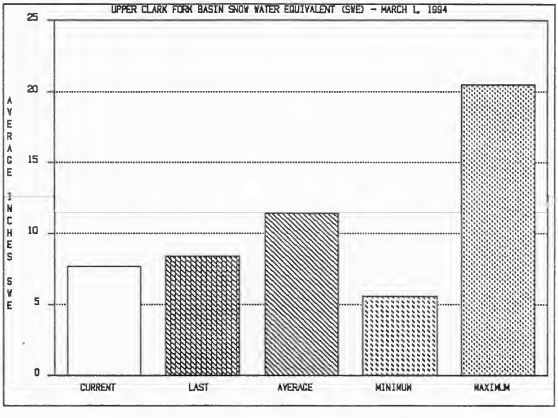
Forecast Pt	<--- Drier ---	Future Conditions	--- Wetter --->			
	Chance of Exceeding *					
Forecast Period	90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
CLARK FORK ab Missoula							
APR-JUL	530	755	905	61	1060	1280	1487
APR-SEP	615	855	1020	61	1180	1430	1681

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was -2.8 in the Clark Fork River above Rock Creek; -2.4 in the Blackfoot River; and -2.6 in the Clark Fork River above Missoula.



AVERAGE IS FOR THE PERIOD 1960-1990.

MINIMUM SNOW WATER EQUIVALENT OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT OCCURRED IN WATER YEAR 1972.

BITTERROOT RIVER BASIN as of March 1, 1994

Snowpack conditions in the Bitterroot River Basin were well below average. Snow water content was 32 percent below average and 8 percent below last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
WEST FORK BITTERROOT	4	97	73
EAST SIDE BITTERROOT	4	92	62
WEST SIDE BITTERROOT	4	89	67
BITTERROOT	12	92	68

Mountain precipitation during February was 15 percent below average and 83 percent above last year. Water year precipitation, beginning October 1, 1993, was 30 percent below average 4 percent below last year.

Reservoir storage, on the last day of February, was 65 percent below average and 112 percent above last year. Painted Rocks Lake storage was 85 percent below average and 19 percent above last year and Como storage was 47 percent below average and 169 percent above last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
PAINTED ROCKS LAKE	31.7	1.9	1.6	12.3
COMO	34.9	7.0	2.6	13.1

Streamflows, for the period April through July, are forecast to be 43 percent below average and 18 percent below last years forecasts.

Streamflow Forecasts

Forecast Pt / Forecast Period	<--- Drier --- 90% (1000AF)	70% (1000AF)	Future Conditions — Chance of Exceeding * — 50% (Most Prob) (1000AF)	(% AVG.)	--- Wetter ---> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
WF BITTERROOT nr Conner (2)							
APR-JUL	41	65	81	53	97	121	152
APR-SEP	44	70	87	52	104	130	166
BITTERROOT nr Darby							
APR-JUL	183	245	290	59	335	395	491
APR-SEP	220	285	330	61	375	440	540
ROCK CK nr Darby (2)							
APR-JUL	40	48	53	67	58	66	79
APR-SEP	43	51	56	67	61	69	83

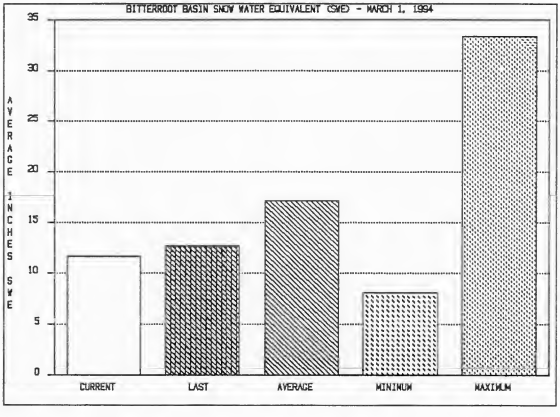
Forecast Pt Forecast Period	<--- Drier --- 90% (1000AF)	70% (1000AF)	Future Conditions 50% (Most Prob) (1000AF)	(% AVG.)	--- Wetter ---> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
	Chance of Exceeding *						
SKALKAHO CK nr Hamilton							
APR-JUL	17.0	22	26	57	30	35	46
APR-SEP	22	28	32	60	36	42	53
BURNT FORK CK nr Stevensville (2)							
APR-JUL	8.0	13.0	16.0	54	19.0	24	29
APR-SEP	11.0	16.0	20	57	23	28	34
BITTERROOT at Missoula							
APR-JUL	510	640	730	56	820	950	1301
APR-SEP	560	700	795	56	890	1030	1418

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was -3.2 in the Bitterroot River.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1972.

LOWER CLARK FORK RIVER BASIN as of March 1, 1994

Snowpack conditions in the Lower Clark Fork River Basin were well below average. Snow water content was 34 percent below average and 15 percent below last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
UPPER CLARK FORK	37	92	68
BITTERROOT	12	92	68
LOWER CLARK FORK	13	85	66
CLARK FORK TOTAL	58	90	68
FLATHEAD	43	100	78
PEND OREILLE	96	95	73

Mountain precipitation during February was 20 percent below average and 101 percent above last year. Water year precipitation, beginning October 1, 1993, was 31 percent below average and 4 percent below last year.

Noxon Rapids storage, on the last day of February, was 10 percent above average and 44 percent above last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
NOXON RAPIDS	335.0	326.7	227.5	298.1

Streamflows, for the period April through July, are forecast to be 34 percent below average and 9 percent below last years forecasts.

Streamflow Forecasts

Forecast Pt / Period	<--- Drier --- 90% (1000AF)	70% (1000AF)	Future Conditions — Chance of Exceeding * — 50% (Most Prob) (1000AF)	(% AVG.)	--- Wetter ---> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
CLARK FORK ab Missoula							
APR-JUL	530	755	905	61	1060	1280	1487
APR-SEP	615	855	1020	61	1180	1430	1681
CLARK FORK bl Missoula							
APR-JUL	1080	1410	1640	59	1870	2200	2788
APR-SEP	1220	1580	1830	59	2080	2440	3099
CLARK FORK at St. Regis (1)							
APR-JUL	810	1680	2070	56	2460	3330	3686
APR-SEP	910	1870	2310	56	2750	3710	4095

Forecast Pt Forecast Period	<--- Drier --- 90% (1000AF)	70% (1000AF)	Future Conditions 50% (Most Prob) (1000AF)	(% AVG.)	--- Wetter ---> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
CLARK FORK nr Plains (1,2)							
APR-JUL	4910	6620	7400	71	8180	9890	10450
APR-SEP	5390	7270	8130	71	8990	10900	11470
THOMPSON RIVER nr Thompson Falls							
APR-JUL	72	99	118	55	137	164	214
APR-SEP	89	118	138	58	158	187	240
PROSPECT CREEK at Thompson Falls							
APR-JUL	44	57	66	54	75	88	123
APR-SEP	51	64	73	55	82	96	132
CLARK FK at Whitehorse Rpds (1,2)							
APR-JUL	5060	7030	7920	68	8810	10800	11730
APR-SEP	5570	7740	8720	68	9700	11900	12910

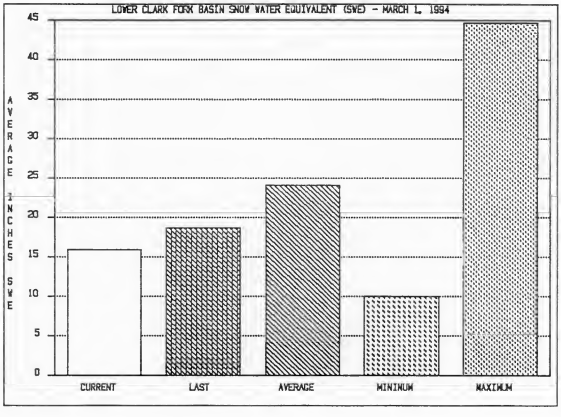
Chance of Exceeding *

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was -3.0 in the Clark Fork River below Bitterroot River and -2.6 in the Clark Fork River below Flathead River.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1972.

JEFFERSON RIVER BASIN as of March 1, 1994

Snowpack conditions in the Jefferson River Basin were below average. Snow water content was 30 percent below average and 17 percent below last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
BEAVERHEAD	15	85	78
RUBY	10	79	68
BIGHOLE	14	92	69
BOULDER	7	83	68
JEFFERSON	37	83	71

Mountain precipitation during February was 9 percent above average and 63 percent above last year. Water year precipitation, beginning October 1, 1993, was 25 percent below average and 13 percent below last year.

Reservoir storage, on the last day of February, was 17 percent above average and 127 percent above last year. Lima storage was 50 percent above average and 416 percent above last year; Clark Canyon storage was 9 percent above average and 93 percent above last year; and Ruby River storage was 19 percent above average and 32 percent above last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
LIMA	84.0	51.6	0.0	34.5
CLARK CANYON	255.6	160.5	83.0	146.6
RUBY RIVER	38.8	32.5	24.7	27.3

Streamflows, for the period April through July, are forecast to be 42 percent below average and 21 percent below last years forecasts.

Streamflow Forecasts

Forecast Pt Forecast Period	<--- Drier --- Future Conditions --- Wetter ---> Chance of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
RED ROCK RIVER near Monida							
APR-JUL	29	46	58	60	70	87	97
APR-SEP	26	47	61	58	75	96	105
BEAVERHEAD RIVER near Grant							
APR-JUL	34	58	75	57	92	116	132
APR-SEP	37	68	89	57	110	141	155
BEAVERHEAD RIVER at Barretts							
APR-JUL	56	85	105	61	125	154	172
APR-SEP	76	107	127	63	148	178	203

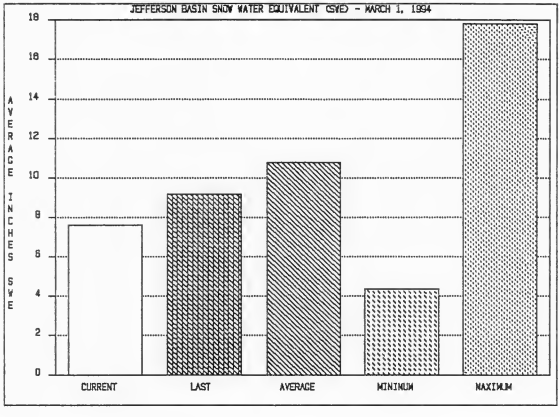
Forecast Pt Forecast Period	<=== Drier ==== 90% (1000AF)	70% (1000AF)	Future Conditions 50% (Most Prob) (1000AF)	(% AVG.)	==== Wetter ===> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
			Chance of Exceeding *				
RUBY RIVER near Alder							
APR-JUL	24	42	54	65	66	84	83
APR-SEP	32	53	67	68	81	102	99
BIG HOLE RIVER near Melrose							
APR-JUL	240	360	440	69	520	640	641
APR-SEP	275	400	485	70	570	695	697
BOULDER RIVER near Boulder							
APR-JUL	21	42	56	66	70	91	85
APR-SEP	23	45	60	66	75	97	91
WILLOW CREEK near Harrison							
APR-JUL	3.9	5.7	8.8	50	12.8	18.8	17.7
APR-SEP	4.2	6.2	9.9	50	14.7	22	20
JEFFERSON RIVER near Three Forks							
APR-JUL	129	325	460	50	595	790	920
APR-SEP	141	350	490	48	630	840	1012

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was 2.8 in the Beaverhead River; -2.1 in the Ruby River; -2.5 in the Big Hole River; -2.8 in the Boulder River; and -2.1 in the Jefferson River as a whole.



AVERAGE IS FOR THE PERIOD 1960-1990.

MINIMUM SNOW WATER EQUIVALENT OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT OCCURRED IN WATER YEAR 1972.

MADISON RIVER BASIN as of March 1, 1994

Snowpack conditions in the Madison River Basin were below average. Snow water content was 24 percent below average and 26 percent below last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
MADISON above HEBGEN	7	75	81
LOWER MADISON	10	74	71
MADISON	17	74	76

Mountain precipitation during February was 29 percent above average and 65 percent above last year. Water year precipitation, beginning October 1, 1993, was 21 percent below average and 23 percent below last year.

Reservoir storage, on the last day of February, was 4 percent above average and the same as last year. Ennis Lake storage was 7 percent below average and 6 percent above last year and Hebgen Lake storage was 5 percent above average and 1 percent below last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
ENNIS LAKE	41.0	31.6	29.9	34.1
HEBGEN LAKE	377.5	260.9	263.1	247.8

Streamflows, for the period April through July, are forecast to be 22 percent below average and 13 percent below last years forecasts.

Streamflow Forecasts

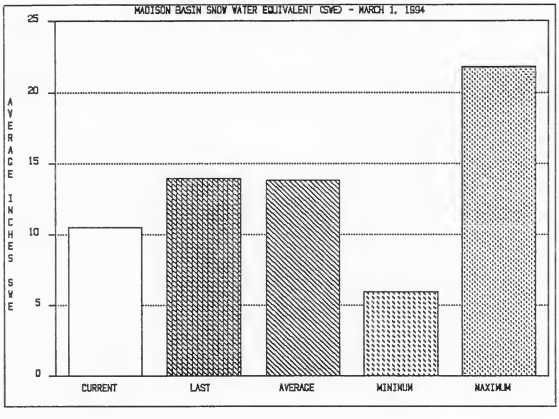
Forecast Pt / Forecast Period	<== Drier == 90% (1000AF)	70% (1000AF)	Future Conditions — Chance of Exceeding * — 50% (Most Prob) (1000AF)	(% AVG.)	== Wetter ==> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
MADISON RIVER near Grayling							
APR-JUL	245	285	310	82	335	375	380
APR-SEP	325	375	405	83	435	485	486
MADISON RIVER near McAllister							
APR-JUL	400	460	500	76	540	600	662
APR-SEP	520	585	630	76	675	740	831

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was -1.5 for the Madison River.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1965.

GALLATIN RIVER BASIN as of March 1, 1994

Snowpack conditions in the Gallatin River Basin were below average. Snow water content was 21 percent below average and 7 percent below last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
UPPER GALLATIN	9	85	77
EAST GALLATIN	7	112	82
GALLATIN	14	93	79

Mountain precipitation during February was 23 percent below average and 57 percent above last year. Water year precipitation, beginning October 1, 1993, was 25 percent below average and 14 percent below last year.

Middle Creek storage, on the last day of February, was 3 percent above average and 44 percent above last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
MIDDLE CREEK	10.2	3.9	2.7	3.8

Streamflows for the period April through July, are forecast to be 26 percent below average and 14 percent below last years forecasts.

Streamflow Forecasts

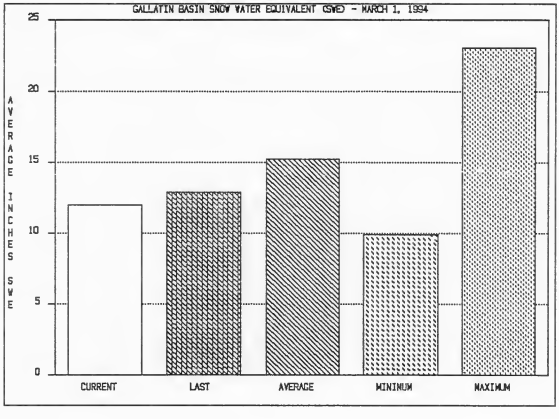
Forecast Pt / Forecast Period	<=== Drier === Future Conditions === Wetter ===> Chance of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
GALLATIN RIVER near Gateway							
APR-JUL	260	305	335	76	365	410	441
APR-SEP	325	375	405	78	435	485	518
E & W FK HYALITE CREEK near Bozeman							
APR-JUL	12.0	15.0	17.0	74	19.0	22	23
APR-SEP	15.0	18.0	20	77	22	25	26
HYALITE CREEK near Bozeman							
APR-JUL	20	24	27	75	30	35	36
APR-SEP	24	29	32	76	35	40	42
GALLATIN RIVER at Logan							
APR-JUL	220	305	360	72	415	500	498
APR-SEP	290	375	435	75	495	580	581

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was -1.9 for the Gallatin River.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1965.

MAINSTEM MISSOURI RIVER BASIN as of March 1, 1994

Snowpack conditions in the Mainstem Missouri River Basin were near average. Snow water content was 7 percent above average and 18 percent above last year. Snow water equivalent for the Helena Valley was 26 percent below average and 9 percent below last year; Mainstem Missouri above Fort Benton was 18 percent below average and 1 percent above last year; and Mainstem Missouri above Fort Peck was 16 percent below average and 6 percent above last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
MISSOURI HEADWATERS	62	84	75
WEST SIDE MISSOURI	7	91	74
SMITH-BELT	6	100	89
MAINSTEM MISSOURI	13	97	82
SUN-TETON-MARIAS	14	118	83
JUDITH-MUSSELSHELL	9	112	98
MISSOURI above FORT PECK	91	92	78
MILK RIVER	8	134	115
MISSOURI in MONTANA	96	94	80
MISSOURI blw YELLOWSTONE	167	101	82

Mountain precipitation during February was 26 percent below average and 29 percent above last year. Water year precipitation, beginning October 1, 1993, was 24 percent below average and 12 percent below last year.

Reservoir storage, on the last day of February, was 2 percent below average and 12 percent above last year. Canyon Ferry Lake storage was 3 percent below average and 12 percent above last year; Helena Valley storage was 2 percent above average and 20 percent below last year; Lake Helena storage was 7 percent above average and the same as last year; Hauser & Helena storage was 4 percent above average and the same as last year; Holter Lake storage was 19 percent above average and 5 percent above last year; and Fort Peck Lake storage was at average and 41 percent above last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
CANYON FERRY LAKE	2043.0	1488.0	1323.0	1540.0
HELENA VALLEY	9.2	4.3	5.4	4.2
LAKE HELENA	10.4	10.9	10.9	10.2
HAUSER & HELENA	61.9	63.4	63.1	61.0
HOLTER LAKE	81.9	81.2	77.2	68.2
FORT PECK LAKE (MAF)	18.9	14.7	10.4	14.7

Streamflows, for the period April through July, are forecast to be 28 percent below average and 63 percent above last years forecasts.

Streamflow Forecasts

Forecast Pt Forecast Period	<-- Drier -- 90% (1000AF)	70% (1000AF)	Future Conditions -- 50% (Most Prob) (1000AF)	(% AVG.)	-- Wetter --> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
			Chance of Exceeding *				
MISSOURI RIVER at Toston							
APR-JUL	760	1180	1460	70	1740	2160	2075
APR-SEP	970	1410	1700	70	2000	2430	2416
PRICKLY PEAR CREEK near Clancy							
APR-JUL	7.0	12.0	16.0	71	23	33	23
APR-SEP	9.0	14.0	19.0	72	27	38	27
SUN RIVER at Gibson Dam							
APR-JUL	280	355	405	85	455	530	478
APR-SEP	315	395	450	86	505	585	526
MISSOURI RIVER at Fort Benton							
APR-JUL	920	1650	2150	70	2650	3380	3087
APR-SEP	1200	1990	2530	69	3070	3860	3678
MARIAS RIVER near Shelby							
APR-JUL	167	260	320	72	380	475	447
APR-SEP	186	280	340	70	400	495	487
MISSOURI RIVER at Virgelle							
APR-JUL	1090	1910	2470	69	3030	3850	3595
APR-SEP	1370	2260	2860	68	3460	4350	4217
MISSOURI RIVER near Landusky							
APR-JUL	1200	2080	2680	69	3280	4160	3897
APR-SEP	1640	2530	3140	69	3750	4640	4580

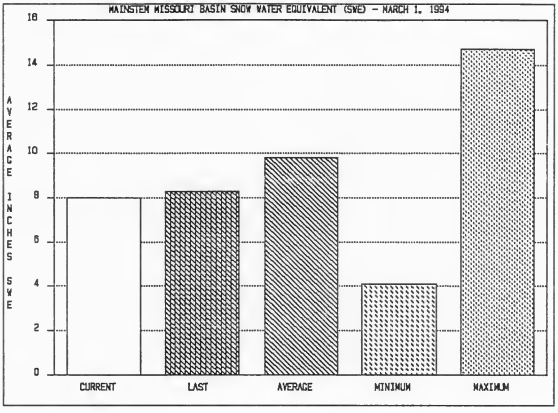
Forecast Pt Forecast Period	<=== Drier === 90% (1000AF)	70% (1000AF)	Future Conditions 50% (Most Prob) (1000AF) (% AVG.)	=== Wetter ===> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
			Chance of Exceeding *			
MISSOURI RIVER below Fort Peck						
APR-JUL	1140	2030	2640 66	3250	4140	4015
APR-SEP	2010	2420	2990 67	3560	4690	4467
LAKE SAKAKAWEA Inflow						
APR-JUL	4890	6630	7820 79	9010	10800	9897
APR-SEP	6130	7770	8950 79	10100	12600	11346

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was -1.7 in the Missouri River above Canyon Ferry; -1.7 in the Missouri River below Canyon Ferry; -0.8 in the Missouri River above Fort Peck; and -0.4 in the Missouri River below Fort Peck.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1972.

SMITH-JUDITH-MUSSELSHELL RIVER BASINS as of March 1, 1994

Snowpack conditions in the Smith-Judith-Musselshell River Basins were near average. Snow water content was 6 percent below average and 8 percent above last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
SMITH-BELT	6	100	89
JUDITH-MUSSELSHELL	9	112	98

Mountain precipitation during February was 19 percent below average and 42 percent above last year. Water year precipitation, beginning October 1, 1993, was 5 percent below average and 1 percent below last year.

Reservoir storage, on the last day of February, was 30 percent above average and 22 percent above last year. Smith River storage was 33 percent above average and 122 percent above last year; Newlan Creek storage was 37 percent above average; Bair storage was 10 percent above average and 7 percent above last year; Martinsdale storage was 72 percent above average and 175 percent above last year; and Deadman's Basin was 22 percent above average and 14 percent below last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
SMITH RIVER	10.6	8.9	4.0	6.7
NEWLAN CREEK	12.4	11.2	----	8.2
BAIR	7.0	4.6	4.3	4.2
MARTINSDALE	23.1	16.2	5.9	9.4
DEADMAN'S BASIN	72.2	56.4	65.7	46.1

Streamflows, for the period April through July, are forecast to be 17 percent below average and 5 percent below last years forecasts.

Streamflow Forecasts

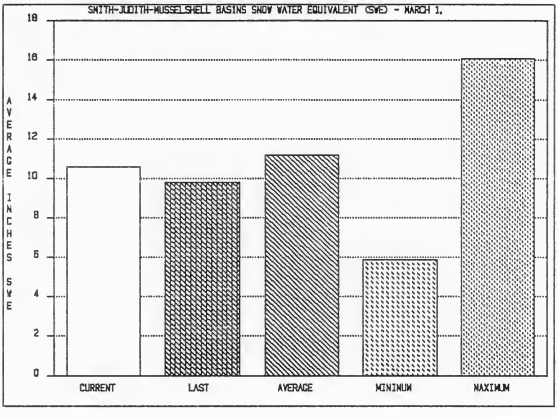
Forecast Pt / Forecast Period	<--- Drier --- Future Conditions --- Wetter ---> Chance of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
SMITH RIVER near Fort Logan							
APR-JUL	28	42	51	82	60	74	62
APR-SEP	39	53	62	85	71	85	73
SHEEP CREEK nr White Sulphur Springs							
APR-JUL	13.6	16.3	18.1	100	19.9	23	18.1
APR-SEP	16.0	19.0	21	100	23	26	21
NF MUSSELSHELL near Delpine							
APR-JUL	2.0	3.4	4.4	92	5.4	6.8	4.8
APR-SEP	2.5	4.0	5.1	91	6.2	7.7	5.6
SF MUSSELSHELL abv Martinsdale							
APR-JUL	9.0	27	40	77	53	71	52
APR-SEP	11.0	30	43	77	56	75	56

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was -0.4 in the Smith River and 0.6 in the Musselshell River.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1987.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1978.

SUN-TETON-MARIAS RIVER BASINS as of March 1, 1994

Snowpack conditions in the Sun-Teton-Marias River Basins were below average. Snow water content was 17 percent below average and 18 percent above last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
SUN-TETON	9	113	82
MARIAS	6	122	84
SUN-TETON-MARIAS	14	118	83

Mountain precipitation for February was 11 percent below average and 153 percent above last year. Water year precipitation, beginning October 1, 1993, was 21 percent below average and 4 percent above last year.

Reservoir storage, on the last day of February, was 25 percent above average and 15 percent above last year. Gibson storage was 6 percent above average and 37 percent above last year; Pishkun storage was 8 percent above average and the same as last year; Willow Creek storage was 45 percent above average and 40 percent above last year; Lower Two Medicine Lake storage was 71 percent above average and 3 percent below last year; Four Horns Lake storage was 12 percent below average and 20 percent below last year; Swift storage was 27 percent above average and 60 percent above last year; Lake Frances storage was 35 percent above average and 151 percent above last year; and Lake Elwell (Tiber) storage was 26 percent above average and 6 percent above last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********* This Year	Last Year	Average
GIBSON	99.1	50.5	36.8	47.5
PISHKUN	32.0	19.0	18.9	17.6
WILLOW CREEK	32.2	31.4	22.5	21.7
LOWER TWO MEDICINE LAKE	11.9	11.8	12.1	6.9
FOUR HORNS LAKE	19.2	11.0	13.7	12.5
SWIFT	30.0	20.8	13.0	16.4
LAKE FRANCES	112.0	93.9	37.4	69.7
LAKE ELWELL (TIBER)	1347.0	730.7	687.3	580.2

Streamflows, for the period April through July, are forecast to be 21 percent below average and 23 percent above last years forecasts.

Streamflow Forecasts

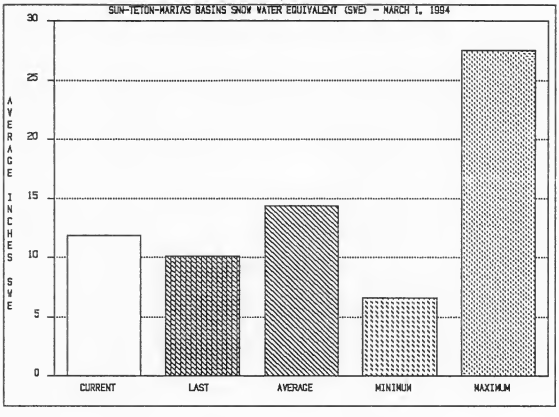
Forecast Pt	<== Drier ==	Future Conditions	== Wetter ==>			
	Chance of Exceeding *					
Forecast Period	90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
SUN RIVER at Gibson Dam							
APR-JUL	280	355	405	85	455	530	478
APR-SEP	315	395	450	86	505	585	526
TWO MEDICINE RIVER near Browning							
APR-JUL	97	143	174	81	205	250	215
APR-SEP	108	154	185	81	215	260	228
BADGER CREEK near Browning							
APR-JUL	58	78	91	88	104	124	104
APR-SEP	71	92	106	88	120	141	120
SWIFT RESERVOIR Inflow near Dupuyer							
APR-JUL	32	47	57	84	67	82	68
APR-SEP	43	59	69	86	80	95	80
DUPUYER CREEK near Valier							
APR-JUL	3.1	6.0	9.3	60	15.3	24	15.5
APR-SEP	3.7	7.0	10.5	60	16.8	26	17.4
CUT BANK CREEK at Cut Bank							
APR-JUL	43	58	68	78	78	93	87
APR-SEP	49	65	75	78	86	101	96
MARIAS RIVER near Shelby							
APR-JUL	167	260	320	72	380	475	447
APR-SEP	186	280	340	70	400	495	487

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was -1.4 in the Sun River; -1.0 in the Teton River; 0.7 in the Birch/Dupuyer Creeks; and -1.2 in the Marias River.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1984.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1972.

Snowpack conditions in the St. Mary were near average and in the Milk River Basins well above average. Snow water content in the St. Mary River Basin was 6 percent below average and 31 percent above last year and the Milk River Basin was 77 percent above average and 57 percent above last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
MILK HEADWATERS	3	124	95
BEAR PAW	5	157	177
MILK RIVER	8	134	115
ST. MARY	5	131	94
ST. MARY and MILK	10	136	105
BOW RIVER in ALBERTA	16	197	103
OLDMAN RIVER in ALBERTA	2	110	81

Mountain precipitation during February was 17 percent above average and 224 percent above last year. Water year precipitation, beginning October 1, 1993, was 14 percent below average and 11 percent above last year.

Reservoir storage, on the last day of February, was 30 percent above average and 129 percent above last year. Lake Sherburne storage was 18 percent above average and 13 percent above last year; Fresno storage was 42 percent above average and 220 percent above last year; Beaver Creek storage was 50 percent above average and 3 percent above last year; and Nelson storage was 22 percent above average and 250 percent above last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
LAKE SHERBURNE	64.3	31.1	27.5	26.3
FRESNO	127.0	73.6	23.0	52.0
BEAVER CREEK	3.5	3.0	2.9	2.0
NELSON	66.8	43.1	12.3	35.3

Streamflows, for the period April through July, are forecast to be 12 percent below average and 12 percent above last years forecasts.

Streamflow Forecasts

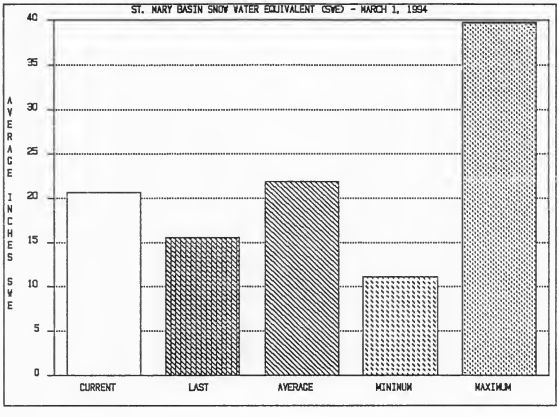
Forecast Pt Forecast Period	<=== Drier === 90% (1000AF)	70% (1000AF)	Future Conditions 50% (Most Prob) (1000AF)	(% AVG.)	=== Wetter ===> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
	Chance of Exceeding *						
SWIFTCURRENT CREEK at Sherburne							
APR-JUL	78	87	93	87	99	108	107
APR-SEP	94	103	110	88	117	126	125
ST. MARY RIVER near Babb							
APR-JUL	290	320	340	86	360	390	395
APR-SEP	345	380	405	87	430	465	463
MILK RIVER at Western Crossing							
MAR-JUL	19.0	28	35	80	42	51	44
MAR-SEP	21	31	37	80	44	53	46
MILK RIVER at Eastern Crossing							
MAR-JUL	42	65	80	100	96	118	80
MAR-SEP	51	73	88	100	103	125	88

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

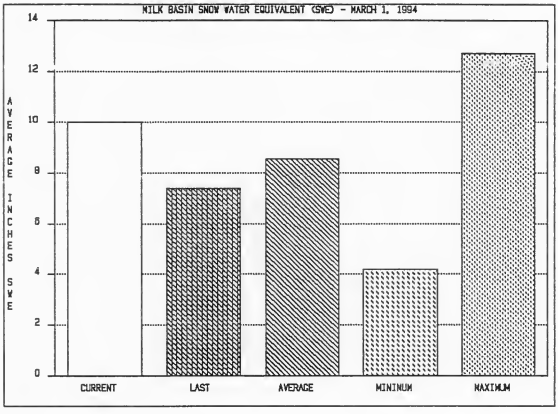
Surface Water Supply Index (SWSI) was 1.9 for the Milk River.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1972.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1973-1993, OCCURRED IN WATER YEAR 1973.

MAXIMUM SNOW WATER EQUIVALENT, 1973-1993, OCCURRED IN WATER YEAR 1978.

UPPER YELLOWSTONE RIVER BASIN as of March 1, 1994

Snowpack conditions in the Upper Yellowstone River Basin were below average. Snow water content was 15 percent below average and 9 percent above last year.

Watershed Snowpack Analysis

Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
YELLOWSTONE ab LIVINGSTON	17	99	83
SHIELDS	5	109	83
BOULDER-STILLWATER	4	105	85
CLARK'S FORK-ROCK CREEK	13	128	87
UPPER YELLOWSTONE above BIGH	35	109	85

Mountain precipitation during February was 4 percent above average and 87 percent above last year. Water year precipitation, beginning October 1, 1993, was 16 percent below average and 4 percent above last year.

Reservoir storage, on the last day of February, was at average and 1 percent above last year. Mystic Lake storage was 52 percent below average and 8 percent above last year and Cooney storage was 20 percent above average and the same as last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
MYSTIC LAKE	21.0	2.8	2.6	5.8
COONEY	27.4	18.5	18.4	15.4

Streamflows, for the period April through July, are forecast to be 17 percent below average and 7 percent above last years forecasts.

Streamflow Forecasts

Forecast Pt Forecast Period	<=== Drier === Future Conditions === Wetter ===> Chance of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
YELLOWSTONE RIVER at Corwin Springs							
APR-JUL	1110	1220	1290	80	1360	1470	1609
APR-SEP	1340	1470	1560	81	1650	1780	1937
YELLOWSTONE RIVER near Livingston							
APR-JUL	1240	1380	1480	80	1580	1720	1855
APR-SEP	1520	1690	1800	80	1910	2080	2241
SHIELDS RIVER near Livingston							
APR-JUL	81	111	132	81	153	183	162
APR-SEP	96	126	147	82	168	198	179
BOULDER RIVER at Big Timber							
APR-JUL	187	230	255	76	280	325	335
APR-SEP	200	240	270	74	300	340	364
WEST ROSEBUD CREEK near Roscoe							
APR-JUL	40	48	53	87	58	66	61
APR-SEP	53	62	67	85	73	81	79
STILLWATER RIVER nr Absarokee							
APR-JUL	300	385	445	89	505	590	498
APR-SEP	380	465	525	89	585	670	593
CLARKS FORK RIVER near Belfry							
APR-JUL	365	420	460	86	500	560	532
APR-SEP	410	470	510	86	550	610	590

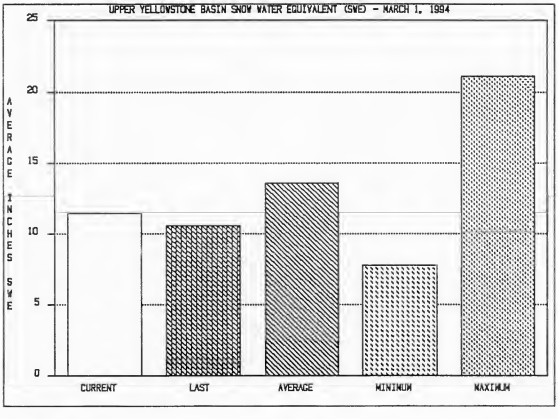
Forecast Pt Forecast Period	<=== Drier === 90% (1000AF)	70% (1000AF)	Future Conditions 50% (Most Prob) (1000AF) (% AVG.)	=== Wetter ===> 30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
			Chance of Exceeding *			
RED LODGE CREEK blw Cooney Res						
APR-JUL	17.0	34	45 96	57	73	47
APR-SEP	28	45	56 98	67	84	57
YELLOWSTONE RIVER at Billings						
APR-JUL	2300	2720	3010 84	3300	3720	3577
APR-SEP	2950	3290	3600 85	3910	4250	4211

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

The average is computed for the 1961-1990 base period.

(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was -1.9 in the Yellowstone River above Livingston; -1.8 in the Shields River; -1.8 in the Boulder River; -1.2 in the Stillwater River; -1.5 in the Rock/Red Lodge Creeks; -1.6 in the Clarks Fork River; -1.8 in the Yellowstone River above Bighorn River.



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1965.

Streamflows, for the period April through July, are forecast to be 15 percent below average and 16 percent above last years forecasts.

Streamflow Forecasts

Forecast Pt / Forecast Period	<--- Drier --- Future Conditions --- Wetter ---> Chance of Exceeding * 90% (1000AF)	70% (1000AF)	50% (Most Prob) (1000AF)	(% AVG.)	30% (1000AF)	10% (1000AF)	30 Yr Avg (1000AF)
YELLOWSTONE RIVER at Billings							
APR-JUL	2300	2720	3010	84	3300	3720	3577
APR-SEP	2950	3290	3600	85	3910	4250	4211
BIGHORN RIVER nr St. Xavier							
APR-JUL	835	1150	1370	83	1590	1910	1645
APR-SEP	880	1260	1500	84	1740	2090	1794
LITTLE BIGHORN RIVER nr Hardin							
APR-JUL	71	122	157	112	192	245	140
APR-SEP	84	139	177	113	215	270	157
TONGUE RIVER near Decker							
APR-JUL	149	205	240	109	275	330	221
APR-SEP	182	235	270	111	305	360	244
YELLOWSTONE RIVER at Miles City							
APR-JUL	2980	3960	4620	85	5280	6260	5431
APR-SEP	3830	4600	5340	85	6080	6780	6281
POWDER RIVER at Moorhead							
APR-JUL	86	135	168	80	200	250	211
APR-SEP	113	159	190	82	220	280	232
POWDER RIVER near Locate							
APR-JUL	137	181	210	83	240	285	252
APR-SEP	151	198	230	83	260	310	276
YELLOWSTONE RIVER nr Sidney							
APR-JUL	3240	4310	5040	85	5770	6840	5925
APR-SEP	4160	4950	5790	85	6630	7870	6814

* 90%, 70%, 30%, and 10% chances of exceeding are the probabilities that the actual flow will exceed the volumes in the table.

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(1) - The values listed under the 10% and 90% Chance of Exceeding are actually 5% and 95% exceedance levels.
(2) - The value is natural flow - actual flow may be affected by upstream water management.

Surface Water Supply Index (SWSI) was -0.8 in the Bighorn River below Bighorn Lake; 2.2 in the Little Bighorn River; -1.4 in the Yellowstone River below Bighorn River; 1.2 in the Tongue River; and 0.3 in the Powder River.

LOWER YELLOWSTONE RIVER BASIN as of March 1, 1994

Snowpack conditions in the Lower Yellowstone River Basin were below average. Snow water content was 14 percent below average and 15 percent above last year.

Watershed Snowpack Analysis

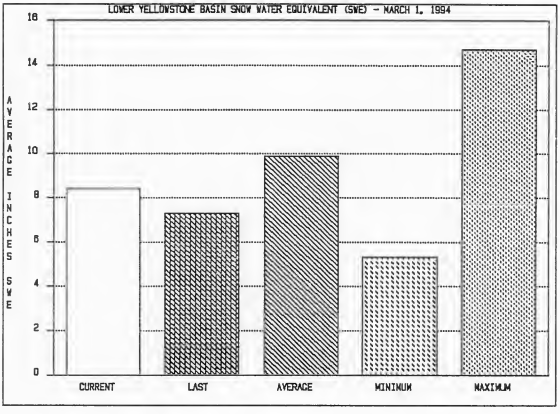
Watershed	Number of Data Sites	This Year as Percent of Last Year	Average
WIND RIVER (Wyoming)	17	92	72
BIGHORN RIVER (Wyoming)	20	127	93
LITTLE BIGHORN	3	153	113
TONGUE RIVER (Wyoming)	9	131	97
POWDER RIVER (Wyoming)	9	131	90
YELLOWSTONE RIVER	77	111	85

Mountain precipitation during February was 22 percent above average and 91 percent above last year. Water year precipitation, beginning October 1, 1993, was 1 percent below average and 19 percent above last year.

Reservoir storage, on the last day of February, was 6 percent below average and 5 percent below last year. Bighorn Lake storage was 4 percent below average and 5 percent below last year and Tongue River was 52 percent below average and 22 percent below last year.

Reservoir Storage (1000AF) End of February

Reservoir	Usable Capacity	********** Usable Storage ********** This Year	Last Year	Average
BIGHORN LAKE	1356.0	775.9	815.0	810.4
TONGUE RIVER	68.0	14.3	18.3	30.1



AVERAGE IS FOR THE PERIOD 1961-1990.

MINIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1977.

MAXIMUM SNOW WATER EQUIVALENT, 1961-1993, OCCURRED IN WATER YEAR 1972.

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Montana
Basin Outlook Report

Soil Conservation Service
Bozeman, MT

SOIL CONSERVATION SERVICE